

1 **Amendment to the Claims**

2 **In the Claims:**

3 Please amend Claims 1, 2, 10, 13, 14, 16, 17, 23, 26, 29, 33, 34, and 43 as follows:

4 1. (Currently Amended) A method for assisting a user to manually focus a camera,
5 comprising the steps of:

6 (a) processing image data produced by the camera to produce a sharpness value
7 that is indicative of a sharpness of focus of the camera in at least a portion of an image, the image
8 data comprising a luminance value for each of a plurality of pixels comprising the image, and the
9 sharpness value being determined based on differences in luminance between the plurality of pixels
10 comprising the image;

11 (b) enabling the user to manually focus the camera; and

12 (c) providing an indication of the focus of the camera to the user as the user
13 manually focuses the camera, to enable the user to adjust the focus of the camera to selectively
14 achieve the sharpest focus possible.

15 2. (Currently Amended) The method of Claim 1, wherein ~~the image data comprise a~~
16 ~~luminance value for each of a plurality of pixels comprising the image,~~ said step of processing
17 ~~comprising~~ comprises the steps of:

18 (a) determining a luminance value for pixels disposed in at least said portion of the
19 image;

20 (b) comparing the luminance value of adjacent pixels disposed in at least said
21 portion of the image to determine the differences in their luminance values; and

22 (c) determining the sharpness value as a function of the differences in the
23 luminance values of adjacent pixels in at least said portion of the image.

24 3. (Original) The method of Claim 2, wherein the step of determining the sharpness value
25 comprises the step of determining a running total of the differences between the luminance values of
26 adjacent pixels in both a horizontal and a vertical direction.

27 4. (Original) The method of Claim 2, wherein at least said portion of the image comprises at
28 least one of a central portion of the image and side portions of the image.

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1 5. (Original) The method of Claim 4, further comprising the step of weighting the luminance
2 values in selected regions of the image included within at least said portion of the image when
3 determining the sharpness value.

4 6. (Original) The method of Claim 1, wherein the step of providing an indication comprises
5 the step of displaying a visual indicator corresponding to the sharpness value so that the focus of the
6 camera is visually perceived by the user viewing the visual indicator.

7 7. (Original) The method of Claim 6, wherein the step of displaying a visual indicator
8 comprises the step of displaying a graphical indicator of the sharpness value.

9 8. (Original) The method of Claim 7, wherein in the step of displaying a visual indicator
10 further comprises the step of indicating a maximum of the sharpness value on the graphical indicator
11 so that as the user adjusts the focus of the camera past a point of sharpest focus, the user is enabled to
12 reverse the adjustment of the focus back to the point of sharpest focus corresponding to the maximum
13 of the sharpness value.

14 9. (Original) The method of Claim 1, wherein the step of providing an indication comprises
15 the step of producing an audible sound indicative of the user achieving the sharpest focus as the user
16 focuses the camera.

17 10. (Original) The method of Claim 1, further comprising the step of enabling the user to
18 link the camera in data communication with a host computing device so that the step of digitally
19 processing the image data is carried out by the host computing device.

20 11. (Currently Amended) The method of Claim 1, wherein the step of ~~digitally~~ processing
21 the image data is carried out by a logic device included within the camera; and wherein the step of
22 providing an indication uses at least one of an audible indication and a visual indication.

23 12. (Original) The method of Claim 11, wherein the audible indication comprises a sound
24 having a varying audible frequency indicative of the sharpness value.

25 13. (Currently Amended) The method of Claim 11, wherein the visual indication comprises
26 at least one of a light having a varying color indicative of the sharpness value, and a digital display of
27 a number indicative of the sharpness value, ~~a graphical display indicative of the sharpness value, and~~
28 ~~a meter that indicates the sharpness value.~~

1 14. (Currently Amended) The method of Claim 1, wherein the step of ~~digitally~~ processing
2 the image data includes the step of determining a weighted average of luminance for different regions
3 of the image.

4 15. (Original) A memory medium on which machine readable instructions are stored, said
5 machine readable instructions, when implemented by a processor, causing steps (a) and (c) in Claim 1
6 to be carried out.

7 16. (Currently Amended) A method for assisting a user to focus a camera that is coupled to a
8 host computing device on which an image produced using image data from the camera is displayed,
9 said method comprising the steps of:

10 (a) digitally processing the image data from the camera using the host computing
11 device, to determine a sharpness value indicative of a focus of the camera, wherein the image data
12 that are processed comprise a luminance value for each of a plurality of pixels comprising the image,
13 and the sharpness value being determined based on differences in luminance between the plurality of
14 pixels comprising the image;

15 (b) in response to changes in the focus caused by the user adjusting the focus of
16 the camera, again determining the sharpness value by digitally processing the image data; and

17 (c) indicating the sharpness of focus of the camera to the user as a function of the
18 sharpness value.

19 17. (Currently Amended) The method of Claim 16, wherein ~~the image data comprise a~~
20 ~~luminance value for each of a plurality of pixels comprising the image;~~ said step of digitally
21 processing ~~comprising~~ comprises the steps of:

22 (a) determining a luminance value for pixels comprising the image;

23 (b) comparing the luminance value of pixels that are adjacent to each other to
24 determine the differences in the luminance values; and

25 (c) determining the sharpness value as a function of the differences in the
26 luminance values.

27 18. (Original) The method of Claim 17, wherein the pixels are disposed in one or more
28 predetermined regions of the image.
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1 19. (Original) The method of Claim 17, wherein the step of digitally processing further
2 comprises the step of determining a running total of the differences in at least one of a horizontal and
3 a vertical direction.

4 20. (Original) The method of Claim 17, wherein the step of digitally processing further
5 comprises the step of weighting the difference in the luminance for pixels in at least one predefined
6 portion of the image, when determining the sharpness value.

7 21. (Original) The method of Claim 16, wherein the step of indicating comprises the step of
8 providing at least one of a visual and an aural indication of the sharpness value as the user adjusts the
9 focus of the camera.

10 22. (Original) The method of Claim 21, wherein the step of providing the visual indication
11 includes the steps of:

- 12 (a) displaying a graphical indication of the sharpness value; and
13 (b) displaying an indication of a maximum of the sharpness value that is achieved
14 as a result of the user adjusting the focus of the camera, so that having adjusted the focus past a
15 sharpest possible focus corresponding to the maximum, the user can readily adjust the focus back to
16 the sharpest possible focus indicated by the maximum that was previously achieved.

17 23. (Currently Amended) A system that provides an indication of sharpness of focus to assist
18 a user in focusing an image, comprising:

19 (a) a camera that includes a lens having a manually adjustable focus control, said
20 camera including a light sensor that produces image data in response to light passing through the
21 lens;

22 (b) a logic device coupled to receive the image data from the light sensor;
23 (c) an indicator, coupled to the logic device, said indicator being adapted to
24 provide an indication of a sharpness of focus of the lens; and

25 (d) said logic device being configured to implement a plurality of functions,
26 including:

27 (i) determining a luminance value for each of a plurality of pixels
28 comprising the image data, and the sharpness value, based on differences in luminance between the
29 plurality of pixels comprising the image;

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1 (ii) processing the luminance values determined for the image data from
2 ~~the light sensor~~ to determine a sharpness value indicative of a focus of the lens; and

3 (ii)

4 (iii) indicating to a user the focus of the lens with the indicator, as a
5 function of the sharpness value, so that a user can determine when the lens is sharply focused.

6 24. (Original) The system of Claim 23, wherein at least one of the logic device and the
7 indicator are disposed within the camera.

8 25. (Original) The system of Claim 24, wherein the indicator comprises at least one of an
9 audio indicator and a visual indicator.

10 26. (Currently Amended) The system of Claim 25, wherein the visual indicator comprises at
11 least one of a light having a color that is indicative of the sharpness value, and a numeric indicator
12 that indicate the sharpness value ~~a graphic display that is indicative of the sharpness value, and a~~
13 ~~meter that indicates the sharpness value.~~

14 27. (Original) The system of Claim 25, wherein the audio indicator produces an audible
15 sound having a frequency that is indicative of sharpness value.

16 28. (Original) The system of Claim 23, wherein the camera is adapted to couple to a host
17 computing device in which at least one of the logic device and the indicator are disposed.

18 29. (Currently Amended) The system of Claim 23, wherein ~~the image data comprise a~~
19 ~~luminance value for each of a plurality of pixels comprising the image;~~ said logic device:

20 (a) ~~determining a luminance value for pixels comprising the image;~~

21 (b) ~~comparing~~ compares the luminance value of pixels that are adjacent to each
22 other to determine the differences in their luminance values; and

23 (c)

24 (b) ~~determining~~ determines the sharpness value as a function of the differences in
25 the luminance values.

26 30. (Original) The system of Claim 29, wherein the pixels are disposed in one or more
27 predetermined regions of the image.

28 31. (Original) The system of Claim 29, wherein the processor determines a running total of
29 the differences in at least one of a horizontal and a vertical direction.
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1 32. (Original) The system of Claim 29, wherein the logic device weights the difference in the
2 luminance for pixels in at least one predefined portion of the image, when determining the sharpness
3 value.

4 33. (Currently Amended) A logic device-readable medium having machine instructions,
5 which when executed by a logic device, cause a plurality of functions to be implemented, including:

6 (a) processing image data from a camera to produce a sharpness value that is
7 indicative of a sharpness of focus of a lens of the camera in at least a portion of an image, wherein the
8 image data that are processed comprise a luminance value for each of a plurality of pixels comprising
9 the image, and wherein the sharpness value is determined based on differences in luminance between
10 a plurality of pixels comprising the image; and

11 (b) in response to a user manually focusing a lens of the camera so as to change
12 the sharpness value, providing an indication of the focus, to enable a user to selectively improve a
13 sharpness of focus.

14 34. (Currently Amended) The logic device-readable medium of Claim 33, wherein ~~the image~~
15 ~~data that are processed comprise a luminance value for each of a plurality of pixels comprising the~~
16 ~~image,~~ said machine instructions ~~causing~~ cause the logic device to:

17 (a) determine a luminance value for pixels disposed in at least said portion of the
18 image;

19 (b) ~~comparing~~ compare the luminance value of adjacent pixels disposed in at least
20 said portion of the image to determine the differences in their luminance values; and

21 (c) determine the sharpness value as a function of the differences in the luminance
22 values of adjacent pixels in at least said portion of the image.

23 35. (Original) The logic device-readable medium of Claim 34, wherein said machine
24 instructions determine the sharpness value by determining a running total of the differences between
25 the luminance values of adjacent pixels in both a horizontal and a vertical direction.

26 36. (Original) The logic device-readable medium of Claim 34, wherein at least said portion
27 of the image comprises at least one of a central portion of the image and side portions of the image.

28 37. (Original) The logic device-readable medium of Claim 36, wherein the machine
29 instructions further cause the logic device to weight the luminance values in selected regions of the
30 image included within at least said portion of the image when determining the sharpness value.

1 38. (Original) The logic device-readable medium of Claim 33, wherein the machine
2 instructions cause a visual indicator to be displayed and varied as a function of the sharpness value,
3 so that the a focus of the lens is visually perceived by a user viewing the visual indicator.

4 39. (Original) The logic device-readable medium of Claim 38, wherein the machine
5 instructions cause a graphical indicator to be displayed to indicate the sharpness value.

6 40. (Original) The logic device-readable medium of Claim 38, wherein the machine
7 instructions further cause the logic device to indicate a maximum of the sharpness value on the
8 graphical indicator so that as a user adjusts the focus past a point of sharpest focus, a user is enabled
9 to readily reverse the adjustment of the focus back to the point of sharpest focus, corresponding to the
10 maximum of the sharpness value.

11 41. (Original) The logic device-readable medium of Claim 33, further comprising an audio
12 transducer coupled to the logic device, wherein the machine instructions cause the logic device to
13 produce an audible sound indicative of a user achieving the sharpest focus as a user focuses the lens.

14 42. (Original) The logic device-readable medium of Claim 41, wherein the audible sound has
15 a varying audible frequency indicative of the sharpness value.

16 43. (Currently Amended) The logic device-readable medium of Claim 33, wherein the
17 indication of focus comprises at least one of a colored light display, and a numeric display, ~~a~~
18 ~~graphical display, and a meter indication.~~

19 44. (Original) The logic device-readable medium of Claim 33, wherein the machine
20 instructions further cause the logic device to determine a weighted average of luminance for different
21 regions of the image and to provide the indication of sharpness of focus as a function of the weighted
22 average.